

XI. FIGURES

Figure 1

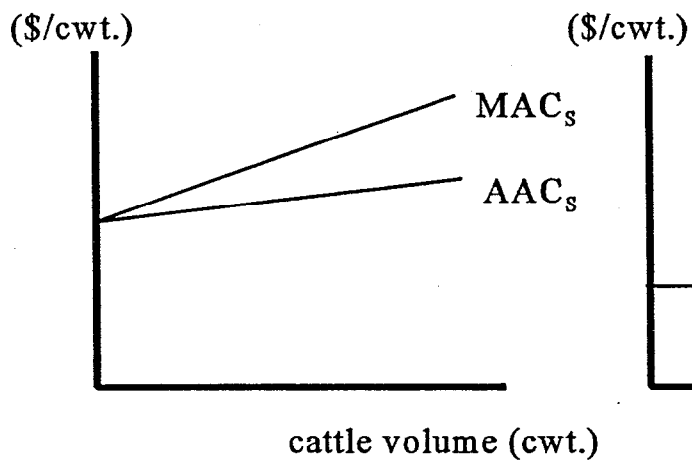


Figure 2

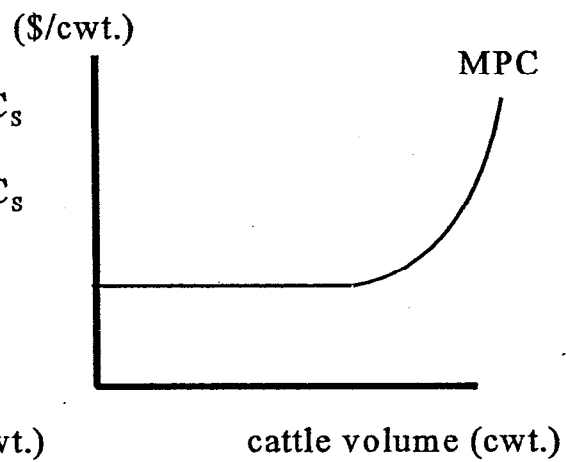


Figure 3

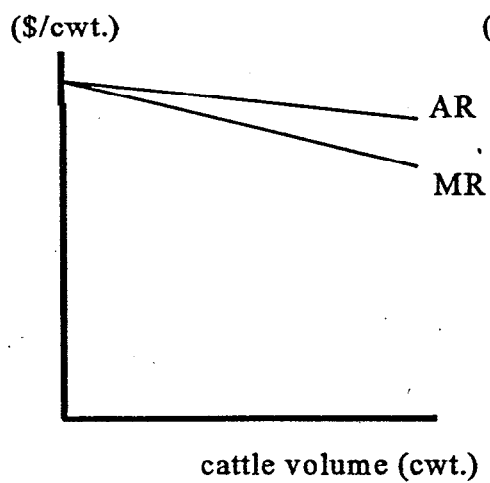
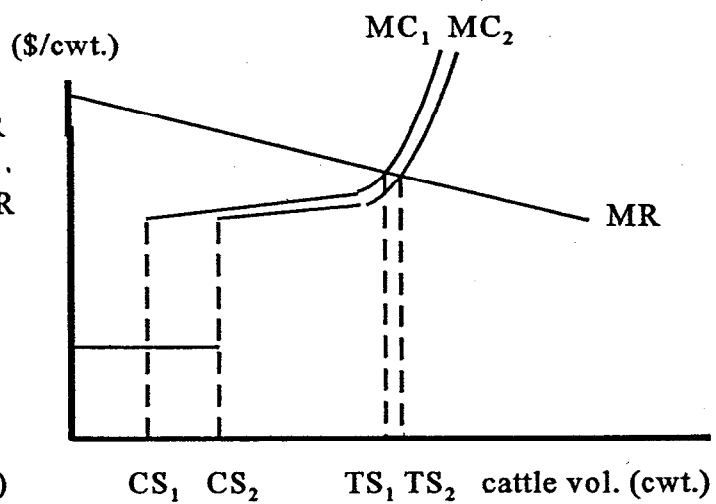


Figure 4



XII. TABLES

Table IV.1. Summary Statistics for the Distributions of the Distance (in miles) that Lots of Fed Cattle Were Shipped to the Plant; by Plant and by Procurement Method.

Table V.1. Percent of Non-cash Supplies of Fed Cattle Accounted for by Forward Contracted Cattle, Packer Fed Cattle, and Marketing Agreement Cattle.

Table V.2. Percent of Plant Slaughter of Fed Cattle Accounted for by Forward Contracted Cattle, Packer Fed Cattle, and Marketing Agreement Cattle.

Table VI.1.1. Summary Statistics on Characteristics of Cattle Lots, by Plant, by Procurement Method.¹

¹A note about sample sizes appears at the end of the table.

²Variable definitions appear at the end of the table.

Table VI.1.1. (continued)

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Table VI.1.1. (continued)

¹For each plant and each procurement method the number of lots upon which these statistics are based is typically smaller than the corresponding number of lots reported in Table IV.1. Table IV.1 figures are based on all lots of fed cattle. The figures in this table are based only on the lots that were used in the product-characteristic price

function analysis reported in Tables VI.1.2, VI.1.3, and VI.1.4. That analysis omitted spot market lots that were not priced on a live-weight basis; and omitted spot, contract, marketing agreement, and packer fed lots that were purchased during the sample's last week; a week for which we had only an incomplete record of lots purchased.

²Variables are defined as follows:

HEAD = number of cattle in the lot (head).
YIELD = the lot's total hot weight divided by total live weight (%).
PCTPC = percentage of the lot grading prime or choice (%).
PCTYG13 = percentage of the lot achieving yield grades of 1, 2, or 3 (%).
MILES = the distance the cattle were shipped to the plant (miles).

Table VI.1.2. Estimates of the price function used in the analysis of quality differences (equation (1)) using the sample of live-weight-priced, spot market lots purchased by ¹ **The dependent variable (PRICE) is the FOB feedyard price of cattle in the lot, on a live-weight basis (\$/cwt.).**

$$R^2 = 0.9647$$

$$\text{Number of observations} = 7423^2$$

$$\bar{R}^2 = 0.9642$$

$$F \text{ value} = 2355.690$$

Independent variables ³	Parameter estimate	Standard error	t-statistic for H_0 : parameter = 0
INTERCEPT	37.37823	2.33416	14.300
HEAD	0.00058	0.000093	6.293
YIELD	0.14415	0.00903	15.965
PCTPC	-0.00144	0.00062	-2.330
PCTYG13	0.03000	0.00152	19.751
MILES	-0.00158	0.00033	-4.823
MILES2	-0.0000011	0.0000008	-1.254
HEIFER	-4.50755	3.23778	-1.392
MIXED	-25.35539	7.13671	-3.553
AWS	0.04432	0.00606	7.310
AW2S	-0.000030	0.000004	-7.399
AWH	0.06467	0.00672	9.620
AW2H	-0.00005	0.0000048	-10.353
AWM	0.11714	0.01906	6.145
AW2M	-0.000082	0.000013	-6.163
MON	0.48528	0.05775	8.403
TUE	-0.02997	0.04586	-0.653
WED	0.19139	0.04380	4.370
THU	0.08529	0.04446	1.918
WKEND	0.27008	0.32707	0.826

¹Separate regressions were run using the live-weight-priced, spot-market lots purchased by each of the other three plants. Those results, while not reported here, were qualitatively similar to

²See the footnote in the text for comments on the composition of the sample.

³The independent variables are defined as follows:

HEAD = number of cattle in the lot (head).
 YIELD = the lot's total hot weight divided by total live weight (%).
 PCTPC = percentage of the lot graded prime or choice (%).
 PCTYG13 = percentage of the lot achieving yield grades of 1, 2, or 3 (%).

MILES =	the distance the cattle were shipped to the plant (miles).
MILES2 =	the square of the distance the cattle were shipped to the plant (miles ²).
HEIFER =	a dummy variable equal to 1 if the lot consists of heifers, and equal to 0 otherwise.
MIXED =	a dummy variable equal to 1 if the lot consists of a mixture of steers and heifers, and equal to 0 otherwise.
AWS =	the lot's average carcass weight, if the lot consists of steers; equal to 0 otherwise (lb.).
AW2S =	the square of the lot's average carcass weight, if the lot consists of steers; equal to 0 otherwise (lb. ²).
AWH =	the lot's average carcass weight, if the lot consists of heifers; equal to 0 otherwise (lb.).
AW2H =	the square of the lot's average carcass weight, if the lot consists of heifers; equal to 0 otherwise (lb. ²).
AWM =	the lot's average carcass weight, if the lot consists of a mixture of steers and heifers; equal to 0 otherwise (lb.).
AW2M =	the square of the lot's average carcass weight, if the lot consists of a mixture of steers and heifers; equal to 0 otherwise (lb. ²).
MON =	a dummy variable equal to 1 if the lot was purchased on a Monday, and equal to 0 otherwise.
TUE =	a dummy variable equal to 1 if the lot was purchased on a Tuesday, and equal to 0 otherwise.
WED =	a dummy variable equal to 1 if the lot was purchased on a Wednesday, and equal to 0 otherwise.
THURS =	a dummy variable equal to 1 if the lot was purchased on a Thursday, and equal to 0 otherwise.
WKEND =	a dummy variable equal to 1 if the lot was purchased on a weekend, and equal to 0 otherwise.

Also included among the independent variables was a set of purchase week dummies for 66 of the 67 weeks represented in the sample. Estimates of these parameters and their standard errors are not reported here.

Table VI.1.3. Estimates of the price function used in the analysis of quality differences (equation (1)) using the sample of live-weight-priced, spot market lots purchased by ¹ **The dependent variable (PRICE) is the delivered hot cost of cattle in the lot, on a carcass-weight basis (\$/cwt).**

$R^2 = 0.9645$

Number of observations = 7423²

$\bar{R}^2 = 0.9641$

F value = 2345.643

Independent variables ³	Parameter estimate	Standard error	t-statistic for H_0 : parameter = 0
INTERCEPT	152.29976	3.81475	39.924
HEAD	0.00089	0.00015	5.864
YIELD	-1.34275	0.01475	-90.996
PCTPC	-0.00165	0.00101	-1.634
PCTYG13	0.04353	0.00248	17.534
MILES	0.00246	0.00054	4.594
MILES2	-0.000013	0.0000014	-9.288
HEIFER	-9.10369	5.29154	-1.720
MIXED	-46.26831	11.66362	-3.967
AWS	0.07037	0.00991	7.103
AW2S	-0.000047	0.0000066	-7.101
AWH	0.10810	0.01099	9.839
AW2H	-0.000082	0.0000079	-10.441
AWM	0.20187	0.03115	6.480
AW2M	-0.000141	0.000022	-6.437
MON	0.72944	0.09439	7.728
TUE	-0.10261	0.07496	-1.369
WED	0.29019	0.07158	4.054
THU	0.05997	0.07266	0.825
WKEND	0.20138	0.53453	0.377

¹Separate regressions were run using the live-weight-priced, spot market lots purchased by each of the other three plants. Those results, while not reported here, were qualitatively similar to the

²See the footnote in the text for comments on the composition of the sample.

³The independent variables are defined as follows:

HEAD = number of cattle in the lot (head).
 YIELD = the lot's total hot weight divided by total live weight (%).
 PCTPC = percentage of the lot graded prime or choice (%).
 PCTYG13 = percentage of the lot achieving yield grades of 1, 2, or 3 (%).

MILES =	the distance the cattle were shipped to the plant (miles).
MILES2 =	the square of the distance the cattle were shipped to the plant (miles ²).
HEIFER =	a dummy variable equal to 1 if the lot consists of heifers, and equal to 0 otherwise.
MIXED =	a dummy variable equal to 1 if the lot consists of a mixture of steers and heifers, and equal to 0 otherwise.
AWS =	the lot's average carcass weight, if the lot consists of steers; equal to 0 otherwise (lb.).
AW2S =	the square of the lot's average carcass weight, if the lot consists of steers; equal to 0 otherwise (lb. ²).
AWH =	the lot's average carcass weight, if the lot consists of heifers; equal to 0 otherwise (lb.).
AW2H =	the square of the lot's average carcass weight, if the lot consists of heifers; equal to 0 otherwise (lb. ²).
AWM =	the lot's average carcass weight, if the lot consists of a mixture of steers and heifers; equal to 0 otherwise (lb.).
AW2M =	the square of the lot's average carcass weight, if the lot consists of a mixture of steers and heifers; equal to 0 otherwise (lb. ²).
MON =	a dummy variable equal to 1 if the lot was purchased on a Monday, and equal to 0 otherwise.
TUE =	a dummy variable equal to 1 if the lot was purchased on a Tuesday, and equal to 0 otherwise.
WED =	a dummy variable equal to 1 if the lot was purchased on a Wednesday, and equal to 0 otherwise.
THURS =	a dummy variable equal to 1 if the lot was purchased on a Thursday, and equal to 0 otherwise.
WKEND =	a dummy variable equal to 1 if the lot was purchased on a weekend, and equal to 0 otherwise.

Also included among the independent variables was a set of purchase week dummies for 66 of the 67 weeks represented on the sample. Estimates of these parameters and their standard errors are not reported here.

Table VI.1.4. Summary statistics for distributions of product-characteristic-price-function-based quality indices; by plant, by procurement method, and for each of two measures of price.

Table VI.2.1. Estimates of the regression used to determine if there are quality-adjusted price differences among spot market, contract, and marketing agreement cattle.

Dependent variable¹ = DPRICE

$R^2 = 0.8976$

Number of observations = 32,538²

$\bar{R}^2 = 0.8973$

F value = 3090.898

Independent variables ³	Parameter estimate	Standard error	t-statistic for H_0 : parameter = 0
INTERCEPT	127.198849	2.438172	52.170
HEAD	0.000844	0.000102	7.260
YIELD	-0.955148	0.012203	-78.273
PCTPC	0.012231	0.000714	17.121
PCTYG13	0.034743	0.002496	13.921
MILES	0.001067	0.000410	2.602
MILES2	-0.000004	0.000001	-3.801
HEIFER	-26.478147	4.041810	-6.551
MIXED	-39.465030	9.211565	-4.284
CARCASS	-0.371363	0.101692	-3.652
AWS	0.073552	0.006030	12.197
AW2S	-0.000051	0.000004	-12.747
AWH	0.154617	0.009715	15.915
AW2H	-0.000113	0.000007	-16.228
AWM	0.182328	0.024816	7.347
AW2M	-0.000127	0.000017	-7.363
	-0.054433	0.037277	-1.460
	-0.585554	0.044356	-13.201
	-0.459479	0.046366	-9.910
M	2.258487	0.122528	18.432
M	1.510664	0.094067	16.059
M	1.640258	0.110003	14.911
M	0.519464	0.122781	4.231
C	2.235046	0.083977	26.615
C	2.462343	0.099649	24.710
C	2.000444	0.134053	14.923
C	-0.012915	0.191826	-0.067

¹The dependent variable, DPRICE, is the delivered hot-cost of the lot, which includes both acquisition and transport cost, on a carcass-weight basis (\$/cwt.)

²The original data set included 35,695 spot market, forward contract, and marketing agreement lots of fed cattle. Of these, three had to be dropped because of missing or obviously incorrect data entries. 812 spot market lots were deleted because the recorded entry for the lot's total delivered cost (which should include transport cost) was less than or equal to the entry for FOB feedyard cost (which should exclude transport cost). This inconsistency does not necessarily mean that the total delivered cost figure (which is used to compute the regression's dependent variable) is in error, but it at least casts some suspicion on its accuracy. An additional 2342 lots were dropped because the FOB feedyard cost, which is needed to perform the check described above, was not recorded. This brought the sample down to 32,538 observations.

³The independent variables are defined as follows:

HEAD =	number of cattle in the lot (head).
YIELD =	the lot's total hot weight divided by total live weight (%).
PCTPC =	percentage of the lot grading prime or choice (%).
PCTYG13 =	percentage of the lot achieving yield grades of 1, 2, or 3 (%).
MILES =	the distance the cattle were shipped to the plant (miles).
MILES2 =	the square of the distance the cattle were shipped to the plant (miles ²).
HEIFER =	a dummy variable equal to 1 if the lot consists of heifers, and equal to 0 otherwise.
MIXED =	a dummy variable equal to 1 if the lot consists of a mixture of steers and heifers, and equal to 0 otherwise.
CARCASS =	a dummy variable equal to 1 if the lot was priced on a carcass-weight basis, and equal to 0 otherwise.
AWS =	the lot's average carcass weight, if the lot consists of steers; equal to 0 otherwise (lb.).
AW2S =	the square of the lot's average carcass weight, if the lot consists of steers; equal to 0 otherwise (lb. ²).
AWH =	the lot's average carcass weight, if the lot consists of heifers; equal to 0 otherwise (lb.).
AW2H =	the square of the lot's average carcass weight, if the lot consists of heifers; equal to 0 otherwise (lb. ²).
AWM =	the lot's average carcass weight, if the lot consists of a mixture of steers and heifers; equal to 0 otherwise (lb.).
AW2M =	the square of the lot's average carcass weight, if the lot consists of a mixture of steers and heifers; equal to 0 otherwise (lb. ²).
	a dummy variable equal to 1 if the lot was purchased by the
	equal to 0 otherwise.
	a dummy variable equal to 1 if the lot was purchased by the
	equal to 0 otherwise.
	a dummy variable equal to 1 if the lot was purchased by the
	equal to 0 otherwise.
M	a dummy variable equal to 1 if the lot was a marketing agreement purchase by the
	and equal to 0 otherwise.
M	a dummy variable equal to 1 if the lot was a marketing agreement purchase by the
	, and equal to 0 otherwise.
M	a dummy variable equal to 1 if the lot was a marketing agreement purchase by the
	and equal to 0 otherwise.
M	a dummy variable equal to 1 if the lot was a marketing agreement purchase by the
	and equal to 0 otherwise.
C	a dummy variable equal to 1 if the lot was a contract purchase by the
	plant, and equal to 0 otherwise.
C	a dummy variable equal to 1 if the lot was a contract purchase by the
	plant, and equal to 0 otherwise.
C	a dummy variable equal to 1 if the lot was a contract purchase by the
	plant, and equal to 0 otherwise.

- C a dummy variable equal to 1 if the lot was a contract purchase by the plant, and equal to 0 otherwise.

Also included among the independent variables was a set of kill week dummy variables for 66 of the 67 weeks represented in the sample. The estimates of these parameters and their standard errors are not reported here.

Table VII.1.1. The spot market cattle price - non-cash supply relationship at the plant-level with RRATIO defined using planning horizon 1.

Dependent variable¹ = RPRICE

$R^2 = 0.2067$

Number of observations = 17,853

$\bar{R}^2 = 0.2030$

F value = 55.797

Independent variables ²	Parameter estimate	Standard error	t-statistic for H_0 : parameter = 0
INTERCEPT	-24.14658	1.18887	-20.310
RRATIO	-0.214910	0.06338	-3.391
HEAD	0.00033	0.000038	8.565
YIELD	0.122009	0.005095	23.947
PCTPC	0.000181	0.000310	0.584
PCTYG13	0.017359	0.000964	18.011
MILES	-0.000855	0.000171	-4.996
MILES2	-0.0000049	0.00000048	-10.266
HEIFER	-8.965112	1.797767	-4.987
MIXED	4.307604	3.796875	1.135
CARCASS	-1.423912	0.225760	-6.307
AWS	0.039168	0.003023	12.955
AW2S	-0.000026	0.000002	-13.030
AWH	0.071609	0.004012	17.850
AW2H	-0.000054	0.000003	-18.866
AWM	0.029370	0.009983	2.942
AW2M	-0.000021	0.000007	-3.082
	0.001754	0.012559	0.140
	-0.144722	0.015946	-9.076
	-0.269425	0.015418	-17.475
MON	0.008186	0.037981	0.216
TUE	0.008826	0.028677	0.308
WED	-0.035215	0.026903	-1.309
THU	-0.033539	0.028077	-1.195

¹The dependent variable, RPRICE, is the price of cattle in the lot, FOB feedyard, on a live weight basis, minus the weighted average steer price, as reported by AMS, for the day of purchase of the lot, in \$/cwt.

²The independent variables are defined as follows:

HEAD = number of cattle in the lot (head).
YIELD = the lot's total hot weight divided by total live weight (%).
PCTPC = percentage of the lot graded prime or choice (%).
PCTYG13 = percentage of the lot achieving yield grades of 1, 2, or 3 (%).
MILES = the distance the cattle were shipped to the plant (miles).
MILES2 = the square of the distance the cattle were shipped to the plant (miles²).
HEIFER = a dummy variable equal to 1 if the lot consists of heifers, and equal to 0 otherwise.
MIXED = dummy variable equal to 1 if the lot consists of a mixture of steers and heifers, and equal to 0 otherwise.

CARCASS =	a dummy variable equal to 1 if the lot was priced on a carcass-weight basis, and equal to zero if it was priced on a live-weight basis.
AWS =	the lot's average carcass weight, if the lot consists of steers; equal to 0 otherwise (lb.).
AW2S =	the square of the lot's average carcass weight, if the lot consists of steers; equal to 0 otherwise (lb. ²).
AWH =	the lot's average carcass weight, if the lot consists of heifers; equal to 0 otherwise (lb.).
AW2H =	the square of the lot's average carcass weight, if the lot consists of heifers; equal to 0 otherwise (lb. ²).
AWM =	the lot's average carcass weight, if the lot consists of a mixture of steers and heifers; equal to 0 otherwise (lb.).
AW2M =	the square of the lot's average carcass weight, if the lot consists of a mixture of steers and heifers; equal to 0 otherwise (lb. ²).
	a dummy variable equal to 1 if the lot was purchased by the
	equal to 0 otherwise.
	a dummy variable equal to 1 if the lot was purchased by the
	equal to 0 otherwise.
	a dummy variable equal to 1 if the lot was purchased by the
	equal to 0 otherwise.
MON =	a dummy variable equal to 1 if the day of purchase was a Monday, and equal to 0 otherwise.
TUE =	a dummy variable equal to 1 if the day of purchase was a Tuesday, and equal to 0 otherwise.
WED =	a dummy variable equal to 1 if the day of purchase was a Wednesday, and equal to 0 otherwise.
THURS =	a dummy variable equal to 1 if the day of purchase was a Thursday, and equal to 0 otherwise.

Also included among the independent variables was a set of purchase week dummies for 60 of the 61 weeks represented in the sample. Estimates of these parameters and their standard errors are not reported here.

Table VII.2.1. Ordinary least squares regression results from estimation of the price regression used in the construction of the ADJCPR series.

Dependent variable¹ = PRICE

F value = 5819.07

Number of observations = 21,040²

R² = 0.9589

$\overline{R}^2 = 0.9587$

Independent variables ³	Parameter estimate	Standard error	t-statistic ⁴ for H ₀ : parameter = 0
INTERCEPT	44.484	0.869	51.18
HEAD	0.000494	0.000044	11.16
YIELD	0.1613	0.0059	27.47
PCTPC	-0.000108	0.00036	-0.298
PCTYG13	0.02339	0.00110	21.28
MILES	-0.000955	0.000196	-4.877
MILES2	-0.0000062	0.0000005	-11.596
HEIFER	-0.1811	0.01496	-12.11
MIXED	-0.2677	0.02486	-10.77
CARCASS	-1.3189	0.2525	-5.223
ACW	0.01431	0.00210	6.808
ACW2	-0.0000110	0.0000014	-7.728
	-0.01720	0.01469	-1.170
	-0.21398	0.01853	-11.550
	-0.37290	0.01769	-21.079
MON	0.1783	0.03111	5.732
TUE	-0.1522	0.02494	-6.104
WED	0.02329	0.02288	1.018
THR	0.00332	0.02357	0.141
WKEND	-0.6270	0.1163	-5.391

¹The dependent variable, PRICE, is the price of cattle in the lot, FOB feedyard, on a live weight basis, in \$/cwt.

²The original data set recorded 24,425 spot market purchases of fed cattle by the four Texas plants combined. Of these, 2,342 had to be deleted because the FOB feedyard price, the value of the regression's dependent variable, was not recorded. Three lots were dropped because of missing or obviously incorrect data entries. An additional 812 were deleted because the recorded entry for the lot's total delivered cost (which should include transport cost) was less than or equal to the entry for FOB feedyard cost (which should exclude transport cost). While this inconsistency does not necessarily mean that the value for FOB feedyard price (FOB feedyard cost divided by the lot's total live weight) is in error, it at least casts some suspicion on its accuracy. Finally, the sample was further restricted to the 66 weeks of the sample (the week of February 5, 1995 through the week of May 5, 1996) for which we had complete information on the cattle killed and at least nearly complete information on the cattle purchased.

³The independent variables are defined as follows:

HEAD = number of cattle in the lot (head).
 YIELD = lot's total hot weight divided by total live weight (%).
 PCTPC = percentage of the lot graded prime or choice (%).
 PCTYG13 = percentage of the lot achieving yield grades of 1, 2, or 3 (%).
 MILES = the distance the cattle were shipped to the plant (miles).
 MILES2 = the square of the distance the cattle were shipped to the plant (miles²).
 HEIFER = a dummy variable equal to 1 if the lot consists of heifers, and equal to 0 otherwise.

- MIXED = a dummy variable equal to 1 if the lot consists of a mixture of steers and heifers, and equal to 0 otherwise.
- CARCASS = a dummy variable equal to 1 if the lot was priced on a carcass-weight basis, and equal to 0 if it was priced on a live-weight basis.
- ACW = the lot's average carcass weight (lbs.)
- ACW2 = the square of the lot's average carcass weight (lb.²).
- a dummy variable equal to 1 if the lot was purchased by the
equal to 0 otherwise.
- a dummy variable equal to 1 if the lot was purchased by the
equal to 0 otherwise.
- a dummy variable equal to 1 if the lot was purchased by the
equal to 0 otherwise.
- MON, TUE, WED, THR, WKEND = dummy variables equal to 1 for the corresponding purchase day of the week, and equal to 0 otherwise.

Also included among the independent variables were a set of purchase week dummies for the first 65 of the sample's 66 weeks. Estimates of these parameters and their standard errors are not reported here. Point estimates ranged from about -5.7 (in week 64) to about 13.6 (in week 2). All but three of these parameter estimates were significant at the 0.01% level (in a two-tailed test).

⁴Except for the coefficients of the purchase day of the week dummies WED and THR, all parameter estimates are significant at the 0.01% level (in a two-tailed test).

Table VII.2.2. Regression results for equation 1 obtained using the Yule-Walker procedure for correcting for AR(1) errors.

	Parameter estimates for the model with dependent variable: ¹							
	AVGSPR	AVGSPR	AVGHPR	AVGHPR	AVGCPR	AVGCPR	ADJCPR	ADJCPR
Constant	7.847 (9.074)	10.999 (9.649)	7.177 (9.139)	10.368 (9.720)	7.297 (9.006)	10.578 (9.547)	7.153 (9.077)	10.740 (9.605)
AVGVAL	0.6151**** (0.0824)	0.5824**** (0.0872)	0.6223**** (0.0829)	0.5893**** (0.0878)	0.6164**** (0.0817)	0.5824**** (0.0862)	0.6176**** (0.0824)	0.5807**** (0.0868)
Q	0.0000158* (0.0000063)	0.0000150* (0.0000063)	0.0000149* (0.0000064)	0.0000141* (0.0000064)	0.0000167** (0.0000063)	0.0000159* (0.0000063)	0.0000168* (0.0000064)	0.0000159* (0.0000063)
CSTOT	-0.000089**** (0.000021)		-0.000090**** (0.000021)		-0.000085*** (0.000021)		-0.000084*** (0.000021)	
CSRAT		-6.7227** (2.0316)		-6.8280** (2.0484)		-6.2706** (2.0073)		-6.1921** (2.0263)
WEEK	-0.2262** (0.0682)	-0.2310** (0.0782)	-0.2272** (0.0684)	-0.2323** (0.0786)	-0.2222** (0.0677)	-0.2273** (0.0777)	-0.2172** (0.0674)	-0.2225** (0.0775)
WEEK2	0.00294** (0.00094)	0.00288** (0.00108)	0.00298** (0.00094)	0.00293** (0.00108)	0.00289** (0.00093)	0.00284* (0.00107)	0.00282** (0.00093)	0.00277* (0.00107)
RHO	0.5911**** (0.1050)	0.6431**** (0.0997)	0.5888**** (0.1052)	0.6417**** (0.0998)	0.5916**** (0.1050)	0.6453**** (0.0995)	0.5817**** (0.1059)	0.6400**** (0.1000)
R ²	0.7311	0.6774	0.7305	0.6766	0.7306	0.6770	0.7293	0.6740

¹Standard errors appear in parentheses. Significance levels (in two-tailed tests) are indicated as follows:

0.01%: ****

0.1%: ***

1.0%: **

5.0%: *

Table VII.2.3. Regression results for equation 1 obtained using 2SLS.¹

	Parameter estimates for the model with dependent variable: ²							
	AVGSPR	AVGSPR	AVGHPR	AVGHPR	AVGCPR	AVGCPR	ADJCPR	ADJCPR
Constant	-11.646 (10.657)	-18.738 (11.421)	-11.668 (10.668)	-18.872 (11.446)	-12.666 (10.595)	-19.693 (11.347)	-12.524 (10.607)	-19.717 (11.382)
AVGVAL	0.8039**** (0.0898)	0.8572**** (0.0961)	0.8057**** (0.0899)	0.8601**** (0.0963)	0.8097**** (0.0893)	0.8626**** (0.0955)	0.8090**** (0.0894)	0.8632**** (0.0958)
Q	0.000022 (0.000023)	0.000025 (0.000024)	0.000021 (0.000023)	0.000025 (0.000024)	0.000023 (0.000023)	0.000026 (0.000024)	0.000023 (0.000023)	0.000027 (0.000024)
CSTOT	-0.000128**** (0.000030)		-0.000131**** (0.000030)		-0.000127**** (0.000029)		-0.000129**** (0.000029)	
CSRAT		-8.4167** (3.1378)		-8.6827** (3.1447)		-8.3176** (3.1175)		-8.4690** (3.1270)
WEEK	-0.2035*** (0.0513)	-0.1688** (0.0557)	-0.2064*** (0.0513)	-0.1721** (0.0559)	-0.1954*** (0.0510)	-0.1609** (0.0554)	-0.1922*** (0.0510)	-0.1575** (0.0555)
WEEK2	0.00323**** (0.00070)	0.00284*** (0.00076)	0.00328**** (0.00070)	0.00290*** (0.00076)	0.00314**** (0.00070)	0.00275*** (0.00076)	0.00309**** (0.00070)	0.00271*** (0.00076)
R ²	0.8376	0.8081	0.8380	0.8081	0.8380	0.8087	0.8374	0.8074

¹The instruments used for two-stage least squares estimation included AVGVAL, WEEK, WEEK2, one period lags of AVGVAL and Q, and current and one-period-lagged CSTOT, for those models with CSTOT as a regressor, or current and one-period-lagged CSRAT, for those models with CSRAT as a regressor.

²Standard errors appear in parentheses. Significance levels (in two-tailed tests) are indicated as follows: 0.01%: ****; 0.1%: ***; 1.0%: **; 5.0%: *.

Table VIII.2.1. The results of ordinary least squares estimation of equation (7), the one-week-ahead price forecasting equation.

Dependent variable¹ = p_{t+1}
F value = 51.038

Number of observations = 65
 $R^2 = 0.9043$

$\bar{R}^2 = 0.8866$

Independent variables ²	Parameter estimate	Standard error	t-statistic for H_0 : parameter = 0
constant	-29.1218	20.8919	-1.394
p_t	1.1878	0.1616	7.349
p_{t-1}	-0.4543	0.1675	-2.713
Δfp_t	-0.4285	0.1456	-2.944
val_t	-0.1422	0.0997	-1.427
r_t	2.1440	2.0700	1.036
cf_t	0.0077	0.0029	2.684
fcp_t	0.2537	0.2109	1.203
$crnp_t$	2.1846	1.5214	1.436
cpl_t	0.0274	0.0101	2.692
$lcpl_t$	0.0327	0.0123	2.656

¹The dependent variable, p_{t+1} , is the average spot market price of steers in the Oklahoma-Texas panhandle region in week $t + 1$, in \$/cwt.

²The independent variables are defined as follows:

- p_t = the value of the dependent variable in week t . (\$/cwt.)
 p_{t-1} = the value of the dependent variable in week $t - 1$ (\$/cwt.)
 Δfp_t = the change in the price of week t 's "nearby" CME live cattle futures contract from the first reporting day of week $t - 1$ to the first reporting day of week t . (\$/cwt.) The "nearby contract" for week t is defined as the one associated with the first contract month to follow week t , assuming that the first day of the contract month is at least 7 days later than the first reporting day of week t . If the first day of a contract month is fewer than 7 days later, the next contract is taken as the "nearby contract."
 val_t = the average boxed beef cutout value for week t . (\$/cwt.) This is exactly the same as the AVGVAL series used in section VII.2.
 r_t = the 6-month Treasury bill secondary market rate on the Friday immediately prior to week t . (%)
 cf_t = the number of cattle on feed in week t in Texas feedyards with capacity of 1000 head or more (1000 head).
 fcp_t = the price of feeder cattle (Oklahoma City; steers: medium #1, 600-650 lbs) in week t (\$/cwt.).
 $crnp_t$ = the price of feed corn (central Illinois; #2, yellow) in week t (\$/bu.).
 cpl_t = the number of cattle placed on feed during week t in Texas feedyards with capacity of 1000 head or more (1000 head).
 $lcpl_t$ = a simple average of the numbers of cattle placed on feed in weeks 15, 16, 17, and 18 weeks prior to week t in Texas feedyards with capacity of 1000 head or more (1000 head).

Table VIII.2.2. The results of ordinary least squares estimation of equation (9), the two-week-ahead price difference forecasting equation.

Dependent variable¹ = $p_{t+2} - p_{t+1}$

F value = 2.450

$\bar{R}^2 = 0.1871$

Number of observations = 64

$R^2 = 0.3162$

Independent variables ²	Parameter estimate	Standard error	t-statistic for H_0 : parameter = 0
constant	-1.1218	24.1126	-0.047
p_t	-0.6161	0.1753	-3.515
p_{t-1}	0.4430	0.1856	2.387
Δfp_t	0.1658	0.1591	1.042
val_t	-0.0662	0.1108	-0.597
r_t	3.1661	2.2489	1.408
cf_t	0.0021	0.0031	0.655
fcp_t	-0.1047	0.2401	-0.436
$crnp_t$	-0.0609	1.8061	-0.034
cpl_t	0.0170	0.0113	1.495
$lcpl_t$	0.0180	0.0135	1.332

¹The dependent variable, $p_{t+2} - p_{t+1}$, is the difference in the average spot market price of steers in the Oklahoma-Texas panhandle region between weeks $t + 1$ and $t + 2$, in \$/cwt.

²The independent variables are defined as follows:

p_t = the average spot market steer price in week t . (\$/cwt.)

p_{t-1} = the average spot market steer price in week $t - 1$ (\$/cwt.)

Δfp_t = the change in the price of week t 's "nearby" CME live cattle futures contract from the first reporting day of week $t - 1$ to the first reporting day of week t . (\$/cwt.) The "nearby contract" for week t is defined as the one associated with the first contract month to follow week t , assuming that the first day of the contract month is at least 7 days later than the first reporting day of week t . If the first day of a contract month is fewer than 7 days later, the next contract is taken as the "nearby contract."

val_t = the average boxed beef cutout value for week t . (\$/cwt.) This is exactly the same as the AVGVAL series used in section VI.2.

r_t = the 6-month Treasury bill secondary market rate on the Friday immediately prior to week t . (%)

cf_t = the number of cattle on feed in week t in Texas feedyards with capacity of 1000 head or more (1000 head).

fcp_t = the price of feeder cattle (Oklahoma City; steers: medium #1, 600-650 lbs) in week t (\$/cwt.).

$crnp_t$ = the price of feed corn (central Illinois; #2, yellow) in week t (\$/bu.).

cpl_t = the number of cattle placed on feed during week t in Texas feedyards with capacity of 1000 head or more (1000 head).

$lcpl_t$ = a simple average of the numbers of cattle placed on feed in weeks 15, 16, 17, and 18 weeks prior to week t in Texas feedyards with capacity of 1000 head or more (1000 head).

Table VIII.2.3. The results of estimation of equation (8), the two-week-ahead price forecasting equation, by the Hatanaka method.

Dependent variable¹ = p_{t+2}^*

Number of observations = 63

F value = 14502

$R^2 = 0.9997$

$\bar{R}^2 = 0.9996$

Independent variables ²	Parameter estimate	Standard error	t-statistic for H_0 : parameter = 0
constant	-6.9551	28.6304	-0.243
p_t	0.6820	0.2613	2.610
p_{t-1}	-0.0506	0.2616	-0.193
Δfp_t	-0.2303	0.2105	-1.143
val_t	-0.1377	0.1233	-1.117
r_t	2.6604	2.8392	0.937
cf_t	0.0069	0.0036	1.906
fcp_t	0.0551	0.2674	0.206
cmp_t	0.6357	2.1021	0.302
cpl_t	0.0388	0.0133	2.925
$lcpl_t$	0.0278	0.0181	1.537

¹The dependent variable in equation (8), p_{t+2} , is the average spot market price of steers in the Oklahoma-Texas panhandle region in week $t + 2$, in \$/cwt. As described in the text, the estimates reported here are obtained by OLS estimation of a transformed version of equation (8), involving a dependent variable that is a transformed version of p_{t+2} . This transformation of the dependent variable is what accounts for the fact that the R^2 and F value reported here are so dissimilar from those reported for the other forecasting equations in Tables VIII.2.1 and VIII.2.2.

²The independent variables are defined as follows:

p_t = the average spot market steer price in week t . (\$/cwt.)

p_{t-1} = the average spot market steer price in week $t - 1$ (\$/cwt.)

Δfp_t = the change in the price of week t 's "nearby" CME live cattle futures contract from the first reporting day of week $t - 1$ to the first reporting day of week t . (\$/cwt.) The "nearby contract" for week t is defined as the one associated with the first contract month to follow week t , assuming that the first day of the contract month is at least 7 days later than the first reporting day of week t . If the first day of a contract month is fewer than 7 days later, the next contract is taken as the "nearby contract."

val_t = the average boxed beef cutout value for week t . (\$/cwt.) This is exactly the same as the AVGVAL series used in section VII.2.

r_t = the 6-month Treasury bill secondary market rate on the Friday immediately prior to week t . (%)

- cf_t = the number of cattle on feed in week t in Texas feedyards with capacity of 1000 head or more (1000 head).
- $fcpt_t$ = the price of feeder cattle (Oklahoma City; steers: medium #1, 600-650 lbs) in week t (\$/cwt.).
- $crmp_t$ = the price of feed corn (central Illinois; #2, yellow) in week t (\$/bu.).
- cpl_t = the number of cattle placed on feed during week t in Texas feedyards with capacity of 1000 head or more (1000 head).
- $lcpl_t$ = a simple average of the numbers of cattle placed on feed in weeks 15, 16, 17, and 18 weeks prior to week t in Texas feedyards with capacity of 1000 head or more (1000 head).

Table VIII.2.4. Results of ordinary least squares estimation of equation (4a), by plant and for the four plants combined.¹

Dependent variable² = QM_{t+2}

Number of observations = 62

					Combined
Intercept	11810.7 (2.270)	15400.7 (2.485)	39340.3 (2.884)	15527.1 (1.940)	82078.8 (3.324)
$E_{it}[p_{t+2}]$	-465.46*** (-3.046)	-219.79 (-0.701)	-1654.6*** (-2.772)	-685.59*** (-2.900)	-3025.4*** (-3.044)
$E_{it}[p_{t+1}]$	304.58*** (2.351)	31.876 (0.124)	1223.4*** (2.401)	473.91*** (2.325)	2033.8*** (2.331)
R^2	0.154	0.089	0.178	0.147	0.266

¹t-statistics are in parentheses. They are based on standard errors, calculated using the Newey-West procedure, that are robust with respect to heteroscedasticity and autocorrelation. For the coefficients of $E_{it}[p_{t+2}]$ and $E_{it}[p_{t+1}]$, significance levels (in one-tailed tests) are indicated as follows:
1%: ***.

²The dependent variable is the number of marketing agreement cattle delivered, in week $t + 2$, to each of the four plants, or to the four plants combined.

Table VIII.2.5. Results of ordinary least squares estimation of equation (4b), by plant and for the four plants combined.¹

Dependent variable² = QM_{t+2}

Number of observations = 62

					Combined
Intercept	1578.2 (7.138)	3454.2 (10.246)	11871.4 (20.429)	2055.6 (5.865)	18959.5 (16.814)
$E[p_{t+2} - p_{t+1}]$	-119.06 (-0.750)	264.85 (1.069)	-1013.2** (-1.918)	-279.50 (-1.245)	-1146.9* (-1.341)
R^2	0.008	0.018	0.071	0.022	0.033

¹t-statistics are in parentheses. They are based on standard errors, calculated using the Newey-West procedure, that are robust with respect to heteroscedasticity and autocorrelation. For the coefficient of $E[p_{t+2} - p_{t+1}]$, significance levels (in one-tailed tests) are indicated as follows: 5%: **; 10%: *.

²The dependent variable is the number of marketing agreement cattle delivered, in week $t + 2$, to each of the four plants, or to the four plants combined.

Table VIII.2.6. Results of ordinary least squares estimation of equations (5a) and (6a) for the and for the four plants combined.¹

Dependent Variable² = QC_{t+2}

Number of observations = 62

				Combined	
	(5a)	(6a)		(5a)	(6a)
Intercept	4516.2 (0.359)	7250.6 (0.539)		10277.0 (0.352)	19412.9 (0.646)
$E_t[p_{t+2}]$	-318.74 (-0.921)			-1102.4 (-1.213)	
$E_t[p_{t+1}]$	268.24 (1.254)			1013.4* (1.512)	
$E_{t+1}[p_{t+2}]$		-502.29 (-0.965)			-1725.6* (-1.422)
p_{t+1}		408.76 (1.228)			1492.7** (1.831)
R^2	0.013	0.039		0.025	0.064

¹t-statistics are in parentheses. They are based on standard errors, calculated using the Newey-West procedure, that are robust with respect to heteroscedasticity and autocorrelation. For the coefficients of $E_t[p_{t+2}]$, $E_t[p_{t+1}]$, $E_{t+1}[p_{t+2}]$, and p_{t+1} , significance levels (in one-tailed tests) are indicated as follows: 5%: **, 10%: *.

²The dependent variable is the number of forward contract cattle delivered in week $t + 2$, to the Excel-Friona plant or to the four plants combined.

Table VIII.2.7. Results of ordinary least squares estimation of equations (5b) and (6b) for the and for the four plants combined.¹

Dependent Variable² = QC_{t+2}

Number of observations = 62

				Combined	
	(5b)	(6b)		(5b)	(6b)
Intercept	1289.4 (3.336)	1283.6 (3.560)		4570.5 (4.683)	4559.2 (5.004)
$E_t[p_{t+2} - p_{t+1}]$	-312.11* (-1.531)			-1255.7** (-1.975)	
$E_{t+1}[p_{t+2}] - p_{t+1}$		-353.83* (-1.437)			-1356.0** (-2.100)
R^2	0.014	0.023		0.034	0.050

¹t-statistics are in parentheses. They are based on standard errors, calculated using the Newey-West procedure, that are robust with respect to heteroscedasticity and autocorrelation. For the coefficients of $E_t[p_{t+2} - p_{t+1}]$ and $E_{t+1}[p_{t+2}] - p_{t+1}$, significance levels (in one-tailed tests) are indicated as follows: 5%: **, 10%: *.

²The dependent variable is the number of forward contract cattle delivered, in week $t + 2$, to the Excel-Friona plant or to the four plants combined.

Table IX.1. Ordinary least squares regression results from the price regression used in the investigation of hypothesis 4.

Dependent variable¹ = HOTCOST

Number of observations = 24,361

F value = 2766.44

R² = 0.9011

\bar{R}^2 = 0.9008

Independent variables ²	Parameter estimate	Standard error	t-statistic ³ for H ₀ : parameter = 0
constant	130.738	1.934	67.61
HEAD	0.000728	0.000105	6.967
YIELD	-0.8933	0.01297	-68.865
PCTPC	0.01846	0.000814	22.664
MILES	0.000969	0.000127	7.631
HEIFER	-0.7684	0.03344	-22.977
MIXED	-1.0929	0.05506	-19.850
CARCASS	-3.2659	.04949	-65.991
PCTYG13	0.01904	0.002087	9.122
ACW	0.06015	0.00477	12.621
ACW2	-0.0000456	0.00000324	-14.062
MON	-0.06804	0.06907	-0.985
TUE	0.03724	0.05465	0.681
WED	0.08828	0.05127	1.722
THR	-0.06158	0.05349	-1.151

¹The dependent variable, HOTCOST, is the lot's total delivered cost divided by total hot weight, in \$/cwt.

²The independent variables are defined as follows:

HEAD = number of cattle in the lot (head).
 YIELD = lot's total hot weight divided by total live weight (%).
 PCTPC = percentage of the lot graded prime or choice (%).
 MILES = number of miles the cattle were shipped to the plant (miles).
 HEIFER = dummy variable equal to 1 if the lot consists of heifers, and equal to 0 otherwise.
 MIXED = dummy variable equal to 1 if the lot consists of a mixture of steers and heifers, and equal to 0 otherwise.
 CARCASS = dummy variable equal to 1 if the lot was priced on a carcass-weight basis, and equal to 0 if it was priced on a live-weight basis.
 PCTYG13 = percentage of the lot achieving yield grades of 1, 2, or 3 (%).
 ACW = lot's average carcass weight (lbs.)
 ACW2 = square of the lot's average carcass weight.
 MON, TUE, WED, THR = dummy variables equal to 1 for the corresponding purchase day of the week, and equal to 0 otherwise.

Also included among the independent variables were a set of kill week dummies for the first 66 of the sample's 67 weeks. Estimates of these parameters and their standard errors are not reported here. Point estimates ranged from about -7 (in week 65) to about 21 (in week 3). All but two of these estimates were significant at the 0.01% level (in a two-tailed test).

³Except for the coefficients of the purchase day of the week dummies, all parameter estimates are significant at the 0.01% level (in a two-tailed test).

Table IX.2. Ordinary least squares regression results for equation (10) used in the test of Hypothesis 4.

	Signs and t-statistics for estimates of β	
Packer (plant) Formulas	Results with marketing agreement deliveries measured in head	Results with marketing agreement deliveries measured as a proportion of weekly slaughter
	+1.213	+1.421
	-0.909	-1.184
	-0.024	-0.024
	-1.529	-0.702
	-1.599	-1.497
	-1.124	-1.278